

FIG. 1

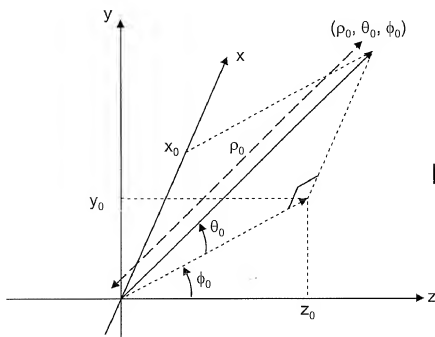


FIG. 2

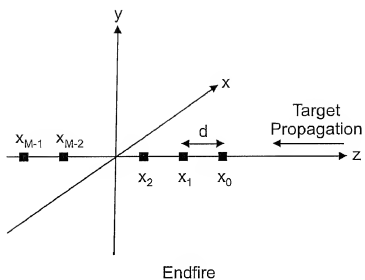


FIG. 3A

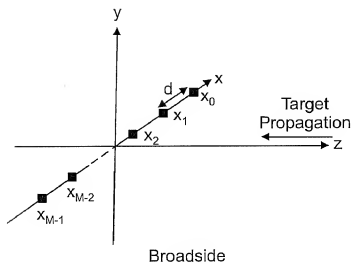
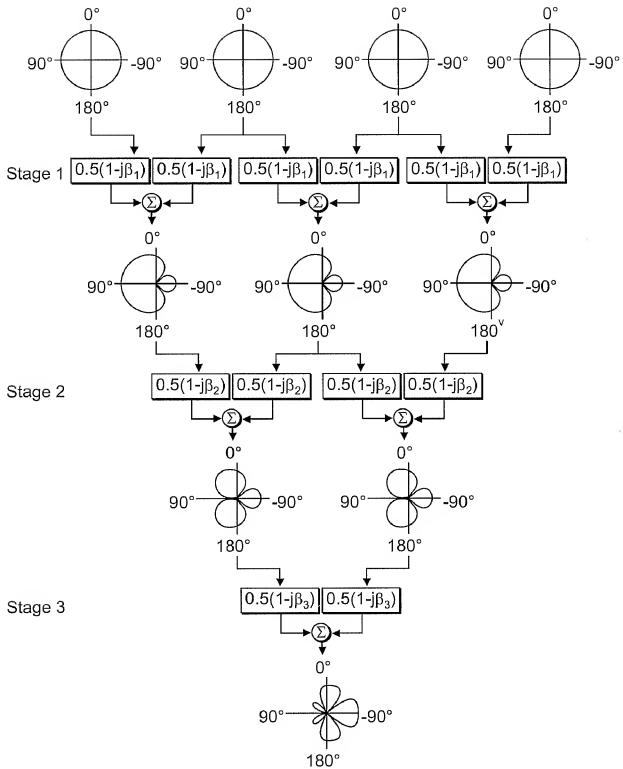


FIG. 3B



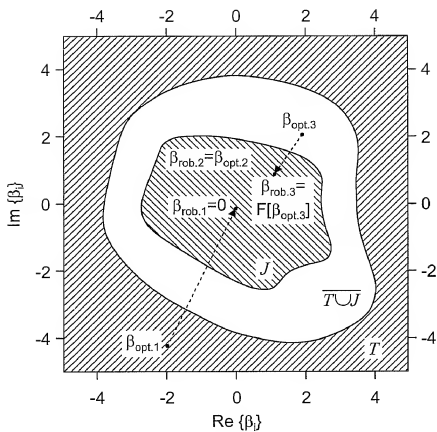


FIG. 5

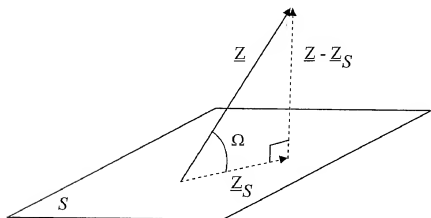
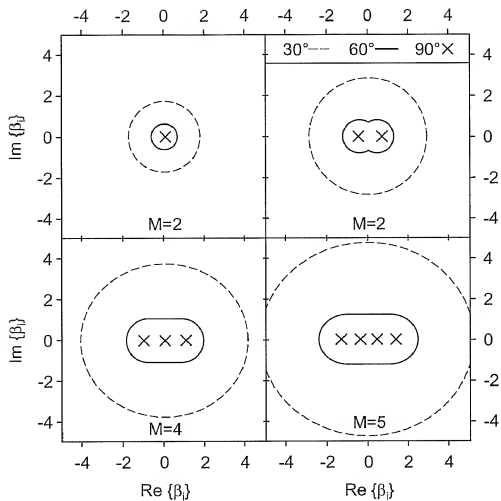


FIG. 6



Contours for $\Omega_i(\beta) = 30^\circ$ (---) 60° (—), and 90° (X) for $M = 2, 3, 4$ and 5 element arrays.

FIG. 7

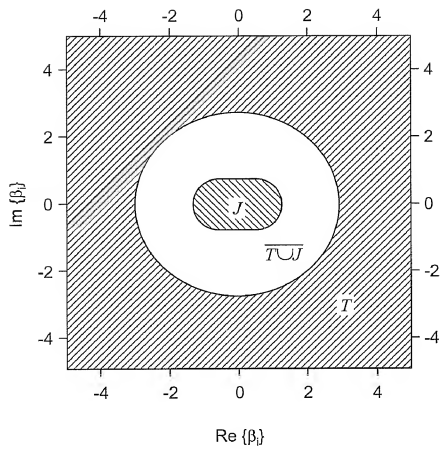
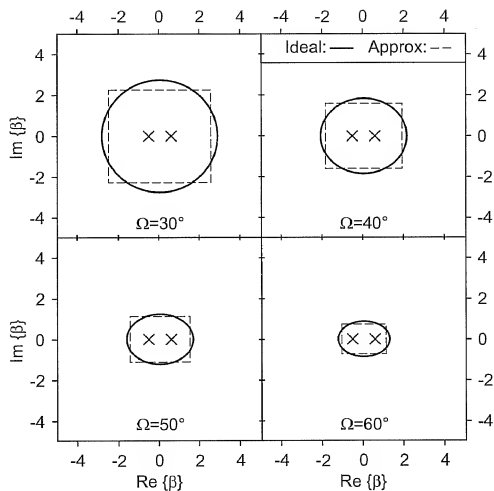


FIG. 8



Contours (—), and approximated contours (---) for $M = 3$ and $\Omega(\beta_i) = 30^\circ, 40^\circ, 50^\circ, \text{ and } 60^\circ$, with β_j also indicated (x).

FIG. 9

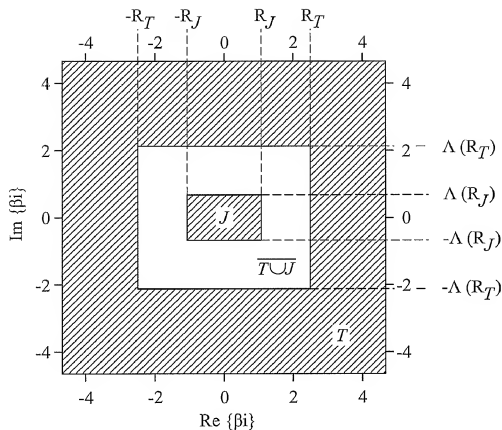
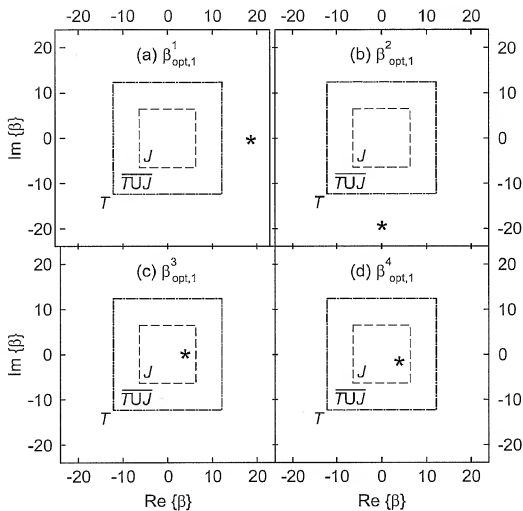


Diagram showing the three modified LENS parameter classification regions for an $M=3$ element array as according to Equation 3.23 when R_T and R_J are chosen to reflect the $\Omega_T = 30^\circ$ and $\Omega_J = 60^\circ$ contours, respectively.

FIG. 10



Four example values of $\beta_{\text{opt},1}$ for two-element array along with the corresponding LENS robustness regions.

FIG. 11

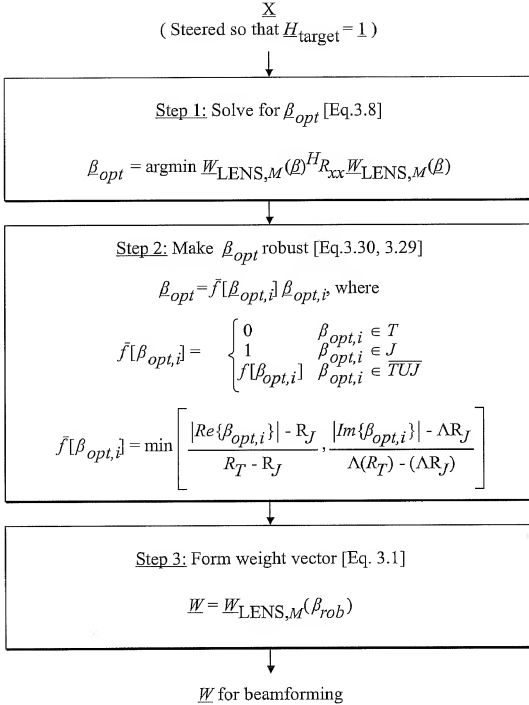


FIG. 12

$$\beta_{\zeta, opt}$$



Step 1: Transform to $\beta_{ns, opt}$ [Eq. 5.4]

$$\beta_{ns, opt, i} = j \frac{(\beta_{\zeta, opt, i+j}) + \zeta(\beta_{\zeta, opt, i+j})}{(\beta_{\zeta, opt, i+j}) - \zeta(\beta_{\zeta, opt, i+j})}$$



Step 2: Standard LENS Robustness
Restriction [Eqs. 3.30, 3.29]

$$\beta_{ns, rob, i} = \tilde{f}[\beta_{ns, opt, i}] \beta_{opt, i}, \text{ where}$$

$$\tilde{f}[\beta_{ns, opt, i}] = \begin{cases} 0 & \beta_{ns, opt, i} \in T \\ 1 & \beta_{opt, i} \in J \\ \tilde{f}[\beta_{ns, opt, i}] & \beta_{ns, opt, i} \in \overline{T \cup J} \end{cases}$$

$$\tilde{f}[\beta_{ns, opt, i}] = \min \left[\frac{|Re\{\beta_{ns, opt, i}\}| - R_J}{R_T - R_J}, \frac{|Im\{\beta_{ns, opt, i}\}| - \Lambda R_J}{\Lambda(R_T) - (\Lambda R_J)} \right]$$



Step 3: Transform to $\beta_{\zeta, rob}$ [Eq. 5.4]

$$\beta_{\zeta, rob, i} = j \frac{(\beta_{ns, rob, i+j}) + (\beta_{ns, rob, i+j})}{(\beta_{ns, rob, i+j}) - (\beta_{ns, rob, i+j})}$$



$$\beta_{\zeta, rob}$$

FIG. 13

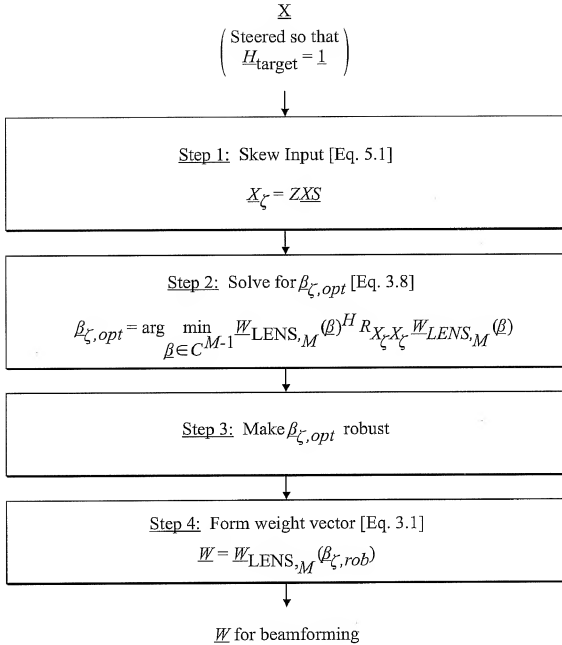


FIG. 14

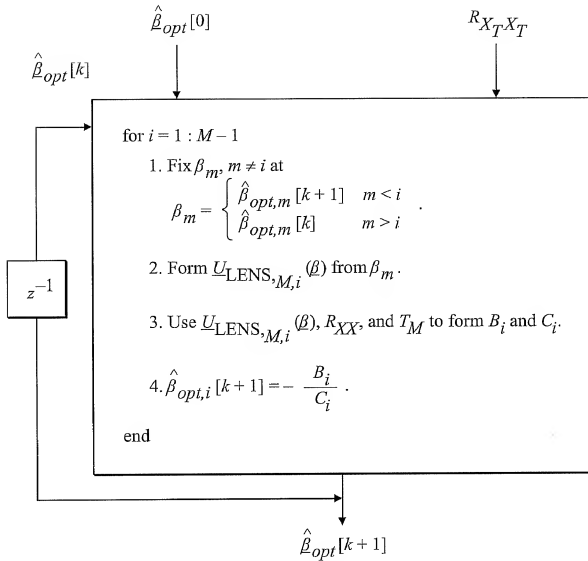


FIG. 15

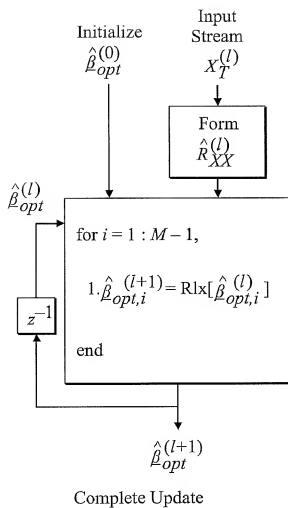


FIG. 16A

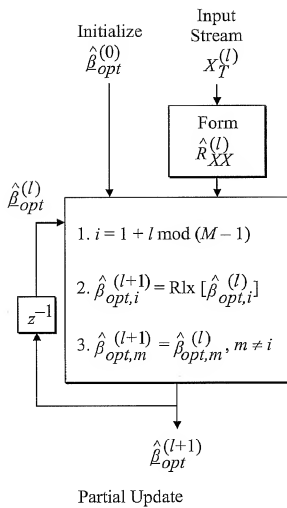


FIG. 16B

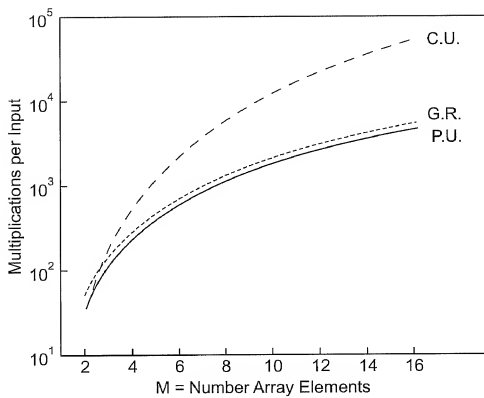


FIG. 17